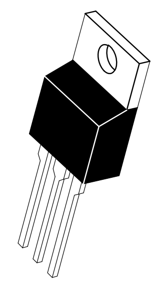
# BU406
# BU407

# NPN Power Transistors

These devices are high voltage, high speed transistors for horizontal deflection output stages of TV's and CRT's.

- High Voltage: $V_{CEV}$ = 330 or 400 V
- Fast Switching Speed: $t_f$ = 750 ns (max)
- Low Saturation Voltage: $V_{CE(sat)}$ = 1 V (max) @ 5 A
- Packaged in Compact JEDEC TO–220AB

**7 AMPERES**
**NPN SILICON**
**POWER TRANSISTORS**
**60 WATTS**
**150 and 200 VOLTS**



CASE 221A–06
TO–220AB

### MAXIMUM RATINGS

| Rating | Symbol | BU406 | BU407 | Unit |
|---|---|---|---|---|
| Collector–Emitter Voltage | $V_{CEO}$ | 200 | 150 | Vdc |
| Collector–Emitter Voltage | $V_{CEV}$ | 400 | 330 | Vdc |
| Collector–Base Voltage | $V_{CBO}$ | 400 | 330 | Vdc |
| Emitter Base Voltage | $V_{EBO}$ | 6 | | Vdc |
| Collector Current — Continuous<br>Peak Repetitive<br>Peak (10 ms) | $I_C$ | 7<br>10<br>15 | | Adc |
| Base Current | $I_B$ | 4 | | Adc |
| Total Device Dissipation, $T_C$ = 25°C<br>Derate above $T_C$ = 25°C | $P_D$ | 60<br>0.48 | | Watts<br>W/°C |
| Operating and Storage<br>Junction Temperature Range | $T_J$, $T_{stg}$ | –65 to 150 | | °C |

### THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|---|---|---|---|
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 2.08 | °C/W |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 70 | °C/W |
| Lead Temperature for Soldering Purposes:<br>1/8″ from Case for 5 Seconds | $T_L$ | 275 | °C |

### ELECTRICAL CHARACTERISTICS ($T_C$ = 25°C unless otherwise noted)

| Characteristic | | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | | |
| Collector–Emitter Sustaining Voltage(1)<br>($I_C$ = 100 mAdc, $I_B$ = 0) | BU406<br>BU407 | $V_{CEO(sus)}$ | 200<br>150 | —<br>— | —<br>— | Vdc |
| Collector Cutoff Current<br>($V_{CE}$ = Rated $V_{CEV}$, $V_{BE}$ = 0)<br>($V_{CE}$ = Rated $V_{CEO}$ + 50 Vdc, $V_{BE}$ = 0)<br>($V_{CE}$ = Rated $V_{CEO}$ + 50 Vdc, $V_{BE}$ = 0, $T_C$ = 150°C) | | $I_{CES}$ | —<br>—<br>— | —<br>—<br>— | 5<br>0.1<br>1 | mAdc |
| Emitter Cutoff Current<br>($V_{EB}$ = 6 Vdc, $I_C$ = 0) | BU406, BU407 | $I_{EBO}$ | — | — | 1 | mAdc |
| **ON CHARACTERISTICS (1)** | | | | | | |
| Collector–Emitter Saturation Voltage ($I_C$ = 5 Adc, $I_B$ = 0.5 Adc) | | $V_{CE(sat)}$ | — | — | 1 | Vdc |
| Base–Emitter Saturation Voltage ($I_C$ = 5 Adc, $I_B$ = 0.5 Adc) | | $V_{BE(sat)}$ | — | — | 1.2 | Vdc |
| Forward Diode Voltage ($I_{EC}$ = 5 Adc) "D" only | | $V_{EC}$ | — | — | 2 | Volts |

(1) Pulse Test: Pulse Width ≤ 300 µs, Duty Cycle ≤ 1%.

(continued)

REV 2

**ELECTRICAL CHARACTERISTICS — continued** ($T_C$ = 25°C unless otherwise noted)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| **DYNAMIC CHARACTERISTICS** | | | | | |
| Current–Gain — Bandwidth Product ($I_C$ = 0.5 Adc, $V_{CE}$ = 10 Vdc, $f_{test}$ = 20 MHz) | $f_T$ | 10 | — | — | MHz |
| Output Capacitance ($V_{CB}$ = 10 Vdc, $I_E$ = 0, f = 1 MHz) | $C_{ob}$ | — | 80 | — | pF |
| **SWITCHING CHARACTERISTICS** | | | | | |
| Inductive Load Crossover Time ($V_{CC}$ = 40 Vdc, $I_C$ = 5 Adc, $I_{B1}$ = $I_{B2}$ = 0.5 Adc, L = 150 μH) | $t_c$ | — | — | 0.75 | μs |

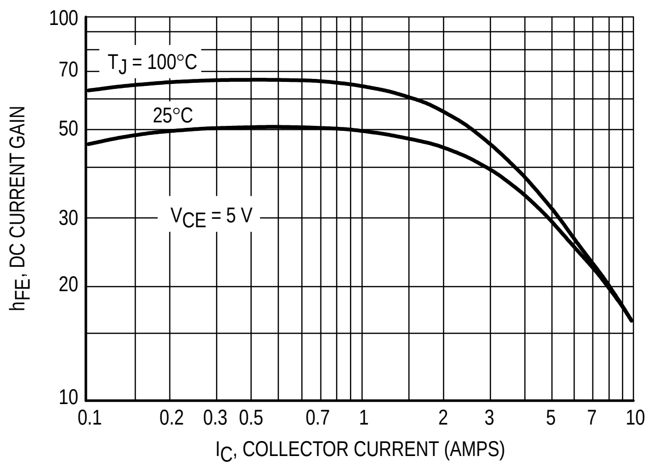



**Figure 1. DC Current Gain**

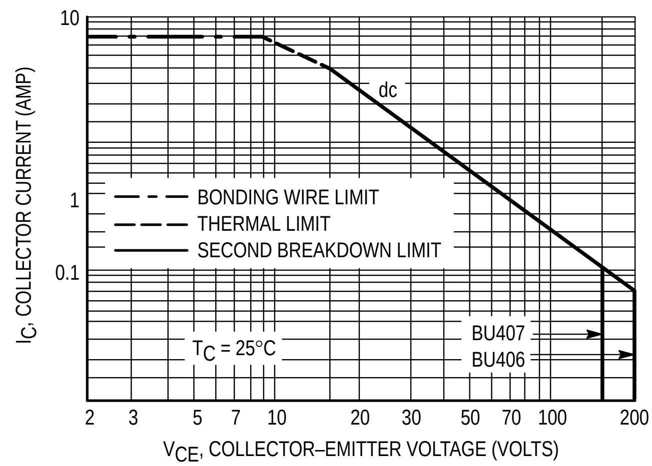
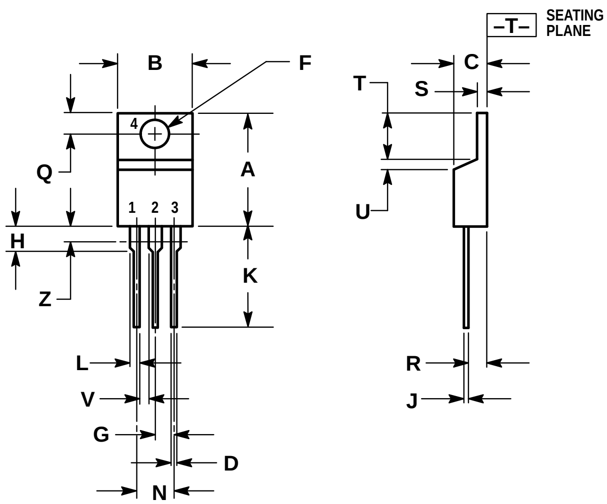



**Figure 2. Maximum Rated Forward Bias Safe Operating Area**

## PACKAGE DIMENSIONS




NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

| | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| DIM | MIN | MAX | MIN | MAX |
| A | 0.570 | 0.620 | 14.48 | 15.75 |
| B | 0.380 | 0.405 | 9.66 | 10.28 |
| C | 0.160 | 0.190 | 4.07 | 4.82 |
| D | 0.025 | 0.035 | 0.64 | 0.88 |
| F | 0.142 | 0.147 | 3.61 | 3.73 |
| G | 0.095 | 0.105 | 2.42 | 2.66 |
| H | 0.110 | 0.155 | 2.80 | 3.93 |
| J | 0.018 | 0.025 | 0.46 | 0.64 |
| K | 0.500 | 0.562 | 12.70 | 14.27 |
| L | 0.045 | 0.060 | 1.15 | 1.52 |
| N | 0.190 | 0.210 | 4.83 | 5.33 |
| Q | 0.100 | 0.120 | 2.54 | 3.04 |
| R | 0.080 | 0.110 | 2.04 | 2.79 |
| S | 0.045 | 0.055 | 1.15 | 1.39 |
| T | 0.235 | 0.255 | 5.97 | 6.47 |
| U | 0.000 | 0.050 | 0.00 | 1.27 |
| V | 0.045 | — | 1.15 | — |
| Z | — | 0.080 | — | 2.04 |

STYLE 1:
PIN 1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR

**CASE 221A–06**
**TO–220AB**
**ISSUE Y**

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